ERVCCLHA
Energy Recovery Ventilator
Sizes 1150 and 1200

Carrier®
Turn to the Experts.

Installation Instructions

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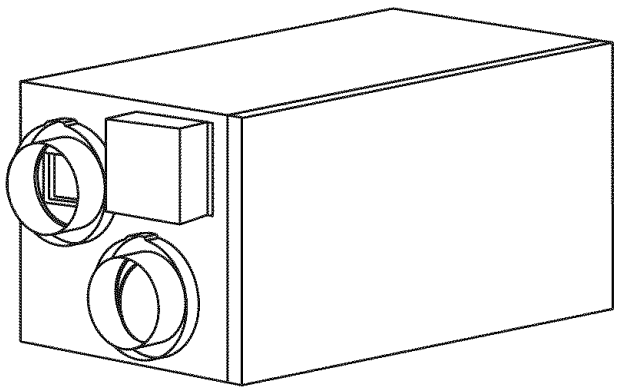

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Fig. 1 - ERVCCLHA Energy Recovery Ventilator

NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Installation and servicing of this equipment can be hazardous due to mechanical and electrical components. Only trained and qualified personnel should install, repair, or service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning and replacing air filters. All other operations must be performed by trained service personnel. When working on this equipment, observe precautions in the literature, on tags, and on labels attached to or shipped with the unit and other safety precautions that may apply.

Follow all safety codes. Installation must be in compliance with local and national building codes. Wear safety glasses, protective clothing, and work gloves. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words; DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

INTRODUCTION

The ERVCCLHA Energy Recovery Ventilator is used to exchange indoor stale air with outside fresh air. The unit is equipped with a special energy recovery core which transfers both sensible and latent heat between the fresh incoming air. The cross-flow design core allows entering and leaving air streams to transfer heat energy without mixing. (See Fig. 2.)

The ERVCCLHA is available in 2 sizes with airflow ranges of 60-148 CFM (28 - 71 L/s), and 60-183 CFM (28 - 89 L/s). The design of this unit is horizontal. Special attention should be given to duct application, balancing the ERV, and locating unit for easy access and routine maintenance.

INSTALLATION CONSIDERATIONS

Inspect Equipment

Move carton to final installation location. Remove ERVCCLHA from carton taking care not to damage unit. Remove all packaging and inspect unit for damage. Remove parts bag from inside unit. File claim with shipping company if shipment is damaged or incomplete. Check to make sure ERV unit matches Fig.1.

Select Location

The ERV **should be located in a conditioned space** and in close proximity to a fused power source. It should be easily accessible for routine maintenance.

If ERV is installed independent of a forced-air system, unit should be located near the center of the air distribution system. If ERV is installed in conjunction with a forced-air system, unit should be located next to (or close to) the indoor equipment.

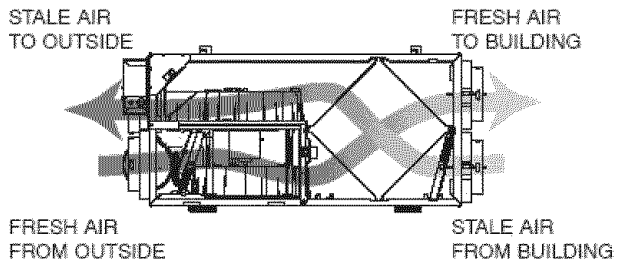

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Fig. 2 - ERV Airflow During Air Exchange

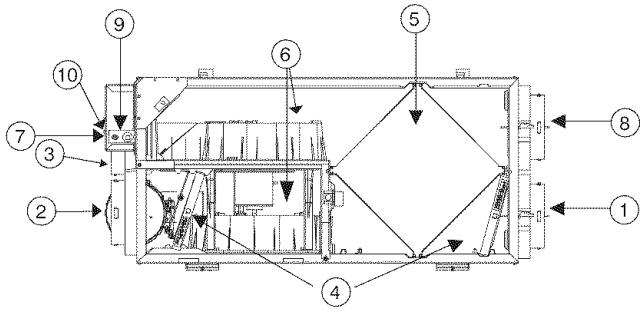

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Fig. 3 - ERVCCLHA Components

Component Description

The following listed items are components of ERVCCLHA (see Fig. 3).

1. Stale air return from building connected to return-air duct system.
2. Fresh-air intake connected to outdoor air inlet hood.
3. Exhaust-air connected to outdoor air exhaust hood.
4. Mechanical filters trap dust contained in the air.
5. Energy recovery core is a cross-flow type. It transfers sensible and latent energy between the 2 air streams.
6. Blowers bring in fresh-air from outside and exhaust stale-air to outside.
7. Electronic control circuit ensures proper unit operation.
8. Fresh-air supply from ERV connected to return-air duct of forced air system.
9. Terminal connector block for wiring wall and timer controls.
10. Electrical cord connects to standard 115v outlet.

UNIT INSTALLATION

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Do not install ERV in a corrosive or contaminated atmosphere.

Mount Unit

The ERV can be suspended from floor joists using chains and 4 springs. Attach metal hanging bracket to all 4 sides of cabinet (see Fig. 4). The unit may be installed on a shelf if an isolation pad is provided to dampen vibration. Unit should always be installed as level as possible.

Independent System Application

In the absence of a forced-air system and a typical duct system layout, the ERV can be applied as an independent or stand alone unit. To ensure comfort, this type of application involves running both fresh-air and return-air registers (or stale-air pickup registers) throughout the home.

Fresh-air registers are normally located in bedrooms, dining rooms, living rooms, and basements. It is recommended that registers be placed 6 to 12" (152 to 305 mm) from the ceiling on an interior wall and airflow directed toward the ceiling. If registers are floor installed, airflow should be directed toward the wall.

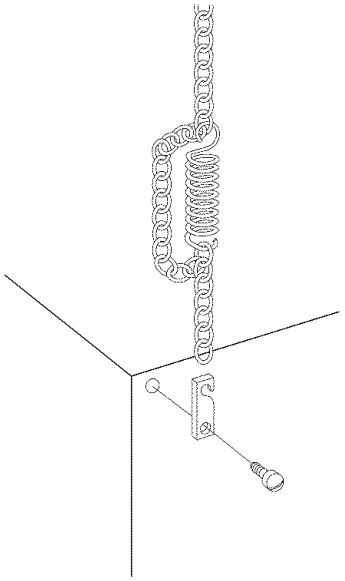

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Fig. 4 - Chain Spring Installation

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD

Failure to follow this warning could result in personal injury or death.

Do not install return-air registers (or stale-air pickup registers) in same room as gas furnace or water heater.

Return-air (or stale-air pickup registers) are normally located to draw from kitchens, bathrooms, basements, or other rooms where stale-air can exist.

Proper size and type of registers must be used to minimize pressure drop. The velocity of airflow through register should not be above 400 ft per minute.

Maximum length of duct for the system should be designed according to the highest speed of the unit. Refer to specifications listed in unit Product Data Digest for ventilation capacities.

Forced-Air Application

Most ERV applications will be installed in conjunction with new or existing forced-air systems. To operate properly, the fresh-air supply and stale-air return from ERV connect directly to return-air duct system. This is how the ERV distributes fresh air and removes stale air from inside of building (see Fig. 5). For these installations, furnace or fan coil blower must be interlocked and operate continuously whenever ERV is energized.

NOTE: The fresh air from ERV is introduced into return-air duct at a point no less than 6 ft (1.8 m) upstream of furnace or fan coil. This connection should be direct (see Fig. 5). This is to allow incoming fresh-air to mix before entering indoor equipment.

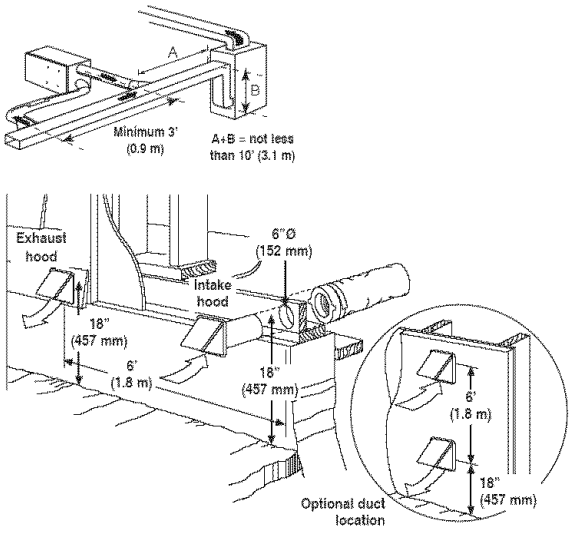

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Fig. 5 - Exhaust Ventilation

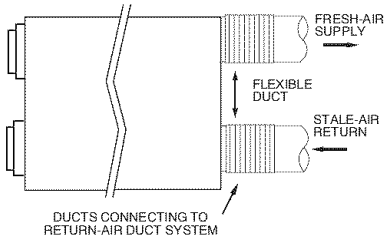

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Fig. 6 - Flexible Duct Fit-Up

Connect Ducts to ERV

⚠ CAUTION

PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in minor property damage from sweating duct or loss of unit efficiency and capacity.

ERV should be installed in a conditioned space with insulated flex duct for supply and exhaust air to the outdoor ambient.

Insulated flexible duct is required on both fresh-air inlet and exhaust-air outlet ducts connecting to exterior wall. When using insulated flexible duct, the vapor barrier of the flexible ducts must be taped very tightly to prevent condensation problems. To reduce pressure drop, stretch the flex duct and support it in a proper manner to avoid reduced airflow.

When connecting the ERV to a return-air duct system, insulated flexible duct can be used. When using metal duct from fresh-air supply to system duct work, the metal duct should be insulated (see Fig. 6). However, when metal or rigid ducts are applied use approximately 18" (457 mm) of flexible duct at ERV ports for fresh-air supply and stale-air return. This can act as a silencer when connecting ducts to return-air duct system. This should eliminate transmission of noise or vibration from unit to main duct system. In addition, there are four 30" (762 mm) duct ties provided to help fasten flexible duct to port on ERV.

Locate and Install Exterior Hoods

IMPORTANT: To prevent condensation problems, insulated flexible ducts are required on both fresh-air inlet and exhaust-air outlet ducts connecting between ERV and exterior wall.

Fresh-air intake and stale-air exhaust must be separated by at least 6 ft (1.8 m). Fresh-air intake must be positioned at least 10 ft (3 m) from nearest dryer vent, furnace exhaust, driveway, gas meter, or oil fill pipe. Fresh-air intake must be positioned as far as possible from garbage containers and potential chemical fumes. When possible, it is advised to locate the intake and exhaust hoods on same side of house or building. The intake and exhaust hoods should never be located on interior corners or in dead air pockets (see Fig. 5). Both intake and exhaust hoods must be 18" (457 mm) from ground and at least 12" (305 mm) above anticipated snow level.

After selecting proper hood locations, make appropriate size hole through exterior wall, pass flexible duct through hole and insert hood tube into duct. Tape duct vapor barrier tightly around hood tube and insert assembly back into wall and fasten securely.

ERV

WALL CONTROL

Location

The ERV wall control is unique to this unit. The ERV will not operate without it. This control senses humidity not temperature. It must be located in an area where it will continually monitor fresh air circulating within the home. Install ERV wall control as close as possible to main system thermostat and follow same guidelines as installing a thermostat (locate approximately 5 ft (1.5 m) above floor, mount on an inside partitioning wall, etc.).

Wiring

Remove top cover assembly from wall control and pass thermostat wire through hole located on back of control before attaching to wall. Connect Y, R, G, and B (yellow, red, green, and black) between wall control and ERV connector following color code (see Fig. 7 and 8). Replace top cover assembly.

NOTE: ERV wall control and circuit board operate on 12 VDC.

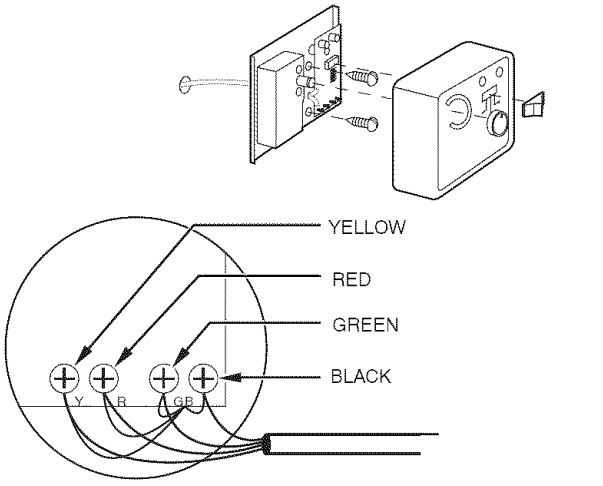

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Fig. 7 - Typical Wall Control

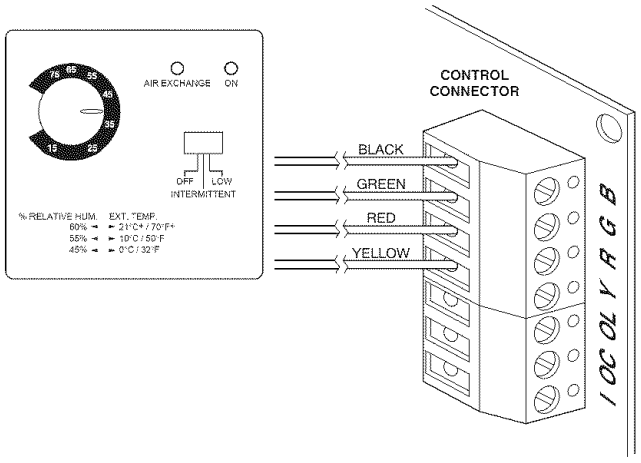

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Fig. 8 - Control Connector

Operation

The ERV wall control has 4 basic modes of operation, OFF, LOW, HIGH, and INTERMITTENT. Be sure that all modes of operation are fully functional. See Table 1 indicating standard control operation.

1. With switch OFF, ERV is inoperative and the LED is out.
2. With switch on LOW, ERV continuously exchanges air with outside. If control is satisfied, blower will run in low speed, otherwise, blower will run on HIGH speed. The LED is illuminated all the time.
3. INTERMITTENT-If relative humidity level inside of building is higher than setpoint, then no air exchange will occur and ERV shuts off. If relative humidity level inside building is lower than setpoint, then air exchange occurs at high speed, and shuts down ERV when humidity level reaches setpoint. This mode is ideal for maintaining proper humidity level when continuous mode cannot. To ensure highest degree of humidity control in cooling season, intermittent mode should be used.

Humidity Selection

The humidity selector is a built-in control designed to properly control the level of humidity in the house during the summer months. This acts like a limit switch. See Table 2 to select maximum humidity level. If the house becomes too dry in winter months, put wall control in INTERMITTENT mode and turn down humidity selector to provide ventilation less frequently.

Table 1 – Basic Control

MODE	OPERATION	DAMPER POSITION	FAN SPEED
Off	Off	Closed to outside	Off
Low	Air exchange with outside	Open to outside	Low
Intermittent	Air exchange with outside	Open to outside	Low
High	Air exchange with outside	Open to outside	High

Table 2 – Recommended Humidity Levels

OUTSIDE TEMPERATURE	DOUBLE-PANE WINDOWS	TRIPLE-PANE WINDOWS
50°F / 10°C	55%	65%
32°F / 0°C	45%	55%
14°F / -10°C	35%	45%
-4°F / -20°C	30%	45%
-22°F / -30°C	25%	35%

NOTE: The ERV may be controlled using the Infinity system control. The ERV may be connected using either a NIM or a 4-Zone Damper Module. See the appropriate instructions if using the NIM of a 4-Zone Damper Module for connection instructions.

OneTouch Control

The OneTouch control may be used as the primary wall control for the ERV. This control will step through the modes of operation with consecutive presses of the button. The LED indicates which mode is currently selected; Off, Intermittent, Low, or High. There is no humidity sensor on the OneTouch, and it will not provide direct humidity control.

Latent Control

NOTE: To ensure highest degree of humidity control in cooling season, the INTERMITTENT mode should be used.

Blower interlock relay is not needed for use with the Infinity system control. The Infinity system control will simultaneously control the ERV and the indoor blower.

Push Button Timers may be used and are connected to the ERV as shown in Figure 9. However, the Infinity system should be set to continuous fan to ensure that the fresh air is circulated in the home. In a Zoned System, at least one zone should be set to continuous fan.

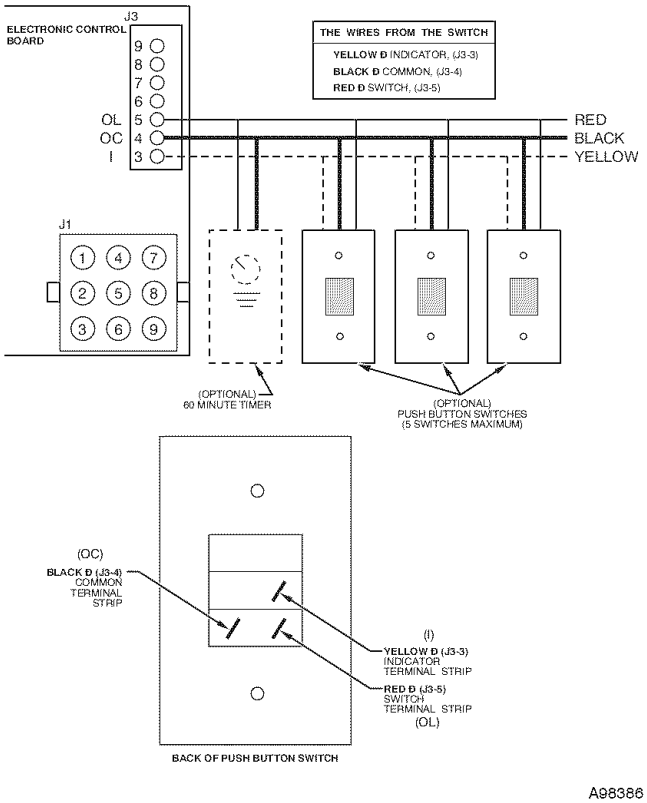

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Fig. 9 - Push Button Timer Wiring Layout

OPERATING THE ERV WITH THE INFINITY CONTROL

The ventilator has four settings in heating mode and three settings in cooling mode.

Heating:

AUTO - the ventilator selects the speed based on indoor humidity and outdoor temperature. It may cycle on/off every 30 minutes depending on humidity and outside temperature.

LOW - low speed all of the time.

HIGH - high speed all of the time.

DEHUM - will only turn on if humidity is 3% over setpoint. The speed is determined by indoor humidity and outdoor temperature.

Cooling:

AUTO - the ventilator selects the speed based on indoor humidity and outdoor temperature. It may cycle on/off every 30 minutes depending on humidity and outside temperature.

LOW - low speed all of the time.

HIGH - high speed all of the time.

If the fan speed is set to Auto and the ventilator wants to run, the fan speed will run at High continuous speed. Otherwise, the fan will stay at the chosen continuous fan speed.

ELECTRICAL CONNECTIONS

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing or servicing system, always turn off main power to system. There may be more than 1 disconnect switch.

115 VAC Wiring

The ERV operates on 115 VAC. It comes with a power cord attached to unit and ready to plug into a fused outlet. Unit must be grounded for proper operation.

All electrical connections must comply with National and Local Electrical Codes, or other ordinances that might apply.

12 VDC Wiring

The ERV circuit board, wall control, and accessories operate on 12 VDC. See Wall Control section, item Wiring and Fig. 7 and 8 for more information.

The ERV comes with an integrated interlock. The interlock can be wired to the system blower to ensure that the blower is running when there is a call for ventilation. See the wiring diagram for proper wiring of the interlock circuit.

ACCESSORIES

20 Minute Timer

A push button timer can be used to override the wall control and put the ERV into high speed for 20 minutes. Connect switches in parallel and connect leads to ERV terminals I, OC, and OL (see Fig. 9). Push button locations are ideal in special activity areas, such as bathrooms or kitchens, where high-speed exhaust operation is needed for a short period of time.

NOTE: The 20 minute timer will not function properly unless ERV wall control is applied and working correctly. Timing function is internal to electronic circuit board, it is activated by a momentary contact between OC and OL. The I connection is to illuminate the push button. The maximum number of push button timers that can be applied is 5.

60 Minute Adjustable Timer

A 60 minute adjustable timer can also be used to override wall control and put ERV into high-speed operation for a select amount of time. Connect timer in parallel with push button timers, or to ERV terminals OC and OL (see Fig. 9).

BALANCING ERV

Balancing intake and exhaust airflow is very important for proper system operation and optimum performance when applying an ERV. Unit balancing prevents a positive and/or negative pressure within the home. Balancing the ERV is done by using balancing dampers in the fresh air intake and stale air exhaust ducts.

Airflow is determined by temporarily connecting a magnehelic gauge to the pressure taps on ERV. (See Fig. 10.) Balancing chart is located on unit door.

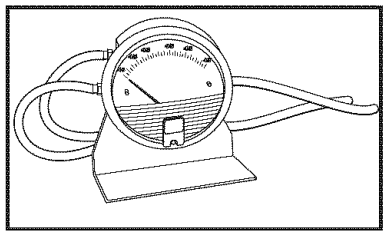

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Fig. 10 - Magnehelic Gauge

If supply-air from outside is greater than exhaust-air from the house, an imbalance can result over pressurizing the home. If exhaust-air is greater than supply-air, combustion appliances may backdraft, bringing exhaust fumes into the house. A balanced condition will ensure optimum performance, provide satisfied customers, and avoid expensive callbacks.

Before proceeding with balancing, all windows, doors, and fireplace flues should be tightly closed. No exhaust systems such as range top exhausts, dryer exhaust, fume hoods, bath or roof fans should be in operation. The forced-air furnace (if used for circulation) should be operating in continuous fan mode for normal operating speed.

Balancing Procedure

Step 1 — Set the unit to high speed.

Make sure that the furnace/air handler blower is ON if the installation is in any way connected to the ductwork of the cold air return. If not, leave furnace/air handler blower OFF. If the outside temperature is below 32°F (0°C), make sure the unit is not running in defrost while balancing. (By waiting 10 minutes after plugging the unit in, you are assured that the unit is not in a defrost cycle.)

Step 2 — Magnehelic gauge placement.

Place the magnehelic gauge on a level surface and adjust it to zero.

Step 3 — Connect tubing from gauge to EXHAUST air flow pressure taps.

Be sure to connect the tubes to their appropriate high/low fittings. (See Fig. 11.) If the gauge drops below zero, reverse the tubing connections.

NOTE: It is suggested to start with the exhaust air flow reading because the exhaust has typically more restriction than the fresh air, especially in cases of fully ducted installations or source point ventilation. Place the magnehelic gauge upright and level. Record equivalent AIR FLOW of the reading according to the balancing chart.

Step 4 — Move tubing to FRESH air flow pressure taps.

Adjust the fresh air balancing damper until the fresh air flow is approximately the same as the EXHAUST air flow. If fresh air flow is less than exhaust air flow, then go back and adjust the exhaust balancing damper to equal the fresh air flow. (See Fig. 11.)

Step 5 — Secure both dampers thumb screw in place with tape.

Step 6 — Record air flow information.

Write the required air flow information on a label and stick it near the unit for future reference (date, maximum speed air flows, your name, phone number and business address).

NOTE: The unit is considered balanced even if there is a difference of ±10 CFM (or ±5 l/s or 17 m^3/h) between the two air flows.

Balancing Dampers

Balancing dampers (sometimes called butterfly dampers) are located in fresh-air intake and stale-air exhaust of the ERV. (See Fig. 11.) Some field modification may be required to ensure proper adjustment of balancing dampers while located in flexible duct. Insulating over these dampers is strongly recommended after balancing is complete to prevent condensation problems.

NOTE: Temporary flow collars are not needed with the new ERVCCLHA models since the air flow pressure taps are incorporated in the access door. (See Fig. 11.)

VENTILATION EVALUATION

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in reduced unit efficiency, capacity or unit life.

DO NOT use ERV during construction of a house or when sanding drywall. This type of dust may damage system.

Ventilator Sizing

Tables 3 and 4 should be used to determine the required airflow for a home. These guidelines are taken from ASHRAE 62.2-2004.

Table 3 – Ventilation Air Requirements, cfm

FLOOR AREA (ft^2)	BEDROOMS				
	0–1	2–3	4–5	6–7	>7
<1500	30	45	60	75	90
1501–3000	45	60	75	90	105
3001–4500	60	75	90	105	120
4501–6000	75	90	105	120	135
6001–7500	90	105	120	135	150
>7500	105	120	135	150	165

Table 4 – Ventilation Air Requirements, L/s

FLOOR AREA (m^2)	BEDROOMS				
	0–1	2–3	4–5	6–7	>7
<139	14	21	28	35	42
139.1–279	21	28	35	42	50
279.1–418	28	35	42	50	57
418.1–557	35	42	50	57	64
557.1–697	42	50	57	64	71
>697	50	57	64	71	78

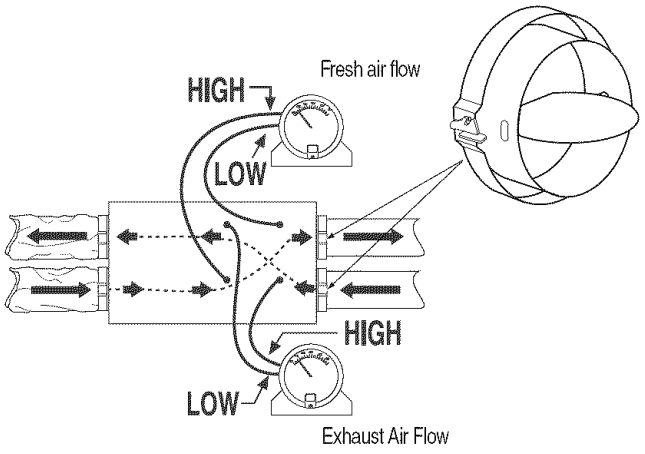

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Fig. 11 - Balancing ERVCCLHA

CONTROL BOARD OPERATION

Board Function

To ensure proper operation of ERV, configuration jumpers are located on electronic control board and must match configuration setup shown in Fig. 12 under Jumper Table. Jumpers are factory set and do not require any changes unless control board is replaced. If control board is replaced, or unusual start-up operation is encountered, check jumpers to make sure they are located properly.

NOTE: Power disconnect for 30 seconds is required to reset the CPU when changing jumpers.

Outdoor Ambient Below 23° F (-5° C)

The ERV continually monitors outside air temperature. If outside air is at or below 23° F (-5° C), ERV will cycle between air exchange and defrost.

The ERV measure the incoming air temperature and will cycle unit in and out of defrost, depending on outdoor ambient. The intake damper will close and circulate indoor air through the core for 6 to 10 minutes. This time depends on jumper location. Refer to Table 5 for defrost cycle.

Table 5 – Defrost Cycle

ERV DEFROST CYCLES		
Outside Temp °F / °C	Standard Defrost (as shipped)	Extended Defrost (Jumper JU1–F Removed)
Above 23°F / –5°C	No Defrost	No Defrost
23 to 5°F / –5 to –15°C	10 Minute Defrost/60 Minute Exchange	10 Minute Defrost/30 Minute Exchange
4 to –17°F / –16 to –27°C	10 Minute Defrost/30 Minute Exchange	10 Minute Defrost/20 Minute Exchange
Below –18°F / –28°C	10 Minute Defrost/20 Minute Exchange	10 Minute Defrost/15 Minute Exchange

OFF and INTERMITTENT/OFF Mode

When ERV is Off, K1 relay is open (see Fig. 12).

High-Speed Air Exchange

When high-speed air exchange occurs, K1 relay closes and K2 (12 VDC relay) is energized. This opens low-speed contacts, and closes high-speed contacts. Then, 115 VAC is applied between orange and gray wires on Molex® plug (pins 1 and 6) and blower motor runs in high-speed operation. Also, 115 VAC is applied across pins 5 and 7, this energizes interlock relay (see Fig. 12).

Low-Speed Air Exchange

When low-speed air exchange occurs, K1 relay closes and K2 (12 VDC relay) is de-energized. This keeps low-speed contacts closed

and high-speed contacts open. Then, 115 VAC is applied between red and gray wires on Molex plug (pins 1 and 4) and blower motor runs in low-speed operation. Also, 115 VAC is applied across pins 5 and 7, energizing interlock relay (see Fig. 12).

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing or servicing system, always turn off main power to system. There may be more than 1 disconnect switch.

⚠ CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

CARE AND MAINTENANCE

Door

ERV door can be removed by unlatching brief case style latches, then lifting door up and sliding it sideways. Door must be in place and secured shut for proper operation.

Filter

Filters in ERV are washable and should be cleaned every 3 months. Use a vacuum cleaner to remove heaviest portion of accumulated dust, then wash in lukewarm water. Allow filter to completely dry before reinstalling. A dirty air filter will cause excessive strain on blower motor. Never operate unit without a filter.

In addition, regularly check and clean screens on exterior intake and exhaust hoods when necessary.

⚠ CAUTION

UNIT COMPONENT DAMAGE HAZARD

Failure to follow this caution may result in unit component damage.

DO NOT clean filters in a dishwasher and DO NOT dry them with a heating appliance or permanent damage will result.

Blower Motor and Wheel

ERV blower motors are factory lubricated for life. Lubricating bearings is not recommended. However, inspect and clean any accumulated dirt and grease from blower motor and wheel annually.

Cleaning the Core

ERV is equipped with a special energy recovery core which is made out of paper and allows transfer of sensible and latent energy. The core should always be only vacuumed every 3 months to remove dust and dirt that could prevent transfer of energy.

NOTE: The core should only be serviced when outdoor temperature is between 60°F and 75°F (16°C and 24°C) and it is dry.

⚠ CAUTION

UNIT COMPONENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

DO NOT use water to clean core or damage will result. In addition, before servicing or removing the core inspect the edges to see if they appear soft (or slightly expanded). This can be normal and due to moisture in the air. DO NOT handle or service core until it is dry or air passages can become damaged and/or closed.

TROUBLESHOOTING

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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NOTE: Reference Table 6 Troubleshooting Chart

This can be a quick guide in resolving unit problems. It is also recommended to review and understand Wall Control Board Operation and Care and Maintenance sections before continuing. There are 3 main parts to focus on when troubleshooting ERV unit:

1. Wall Control
2. Electronic control board
3. Blower motor

Wall Control

Use Table 1 to determine if wall control is operating correctly. Use Fig. 7 and Table 5 to check control wire connections.

NOTE: The electronic control board and wall control operate on 12 VDC.

Control Board

Electronic control board must have wall control attached before unit will function properly. Also, configuration jumpers located on control board must match configuration setup show in Fig. 12 under Jumper Table. In addition, outside air thermistor must be connected to control board for it to operate properly. See Table 8, Temperature - vs - Ohm Chart, for valid temperature range.

Blower Motor

The ERV blower motor operates on 115 VAC, with 2-speed operation.

The easiest way to check blower speed operation is to use the wall control and initiate a low-speed blower and high-speed blower operation using intermittent mode (see Table 1).

NOTE: If, after using the following test, you still hear relays clicking upon charge, carefully check wiring, blower capacitor, and blowers.

Alternate procedure to check blower speed:

Blower Speed Test

HIGH SPEED

1. Disconnect ERV from 115 VAC.
2. Unplug wall control wires at control module terminal block inside ERV.
3. Plug ERV back to 115 VAC.
4. Attach a wire across J3-8 and J3-9 (B and G) on control module terminal block.
5. Push in door switch, this will initiate a high-speed exchange.

LOW SPEED

1. Unplug ERV from 115 VAC.
2. Disconnect wall control wires at control module terminal block inside ERV.
3. Plug ERV back to 115 VAC.
4. Connect a 3.0 K ohm resistor between B and G on control module terminal block.
5. Push in door switch, this will initiate a low-speed exchange.

Blower Speed Selection

Three-speed blowers are factory connected to electronic control board on HIGH- and LOW-speed taps of blowers. Installer can easily change low-speed tap to medium-speed tap so electronic control will select between high and medium speed. Connections can be changed at motor location (see Table 9 and 10).

To change low speed to medium speed, proceed as follows:

1. Unplug unit from 115 VAC.
2. Remove filters and core from ERV.
3. Slide blower assembly to the right until wire connections are visible.
4. Locate red wire and blue wire coming from blower assembly.
5. Unplug red wire from quick connect.
6. Unplug protecting cap quick connection from blue wire and put on red wire coming from blower. The cap is a safety insulator.
7. Connect red wire of main harness to blue wire.
8. Replace wires, blower assembly, filters, and core.

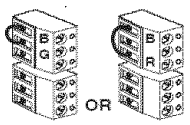
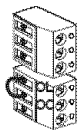
Outdoor Air Thermistor

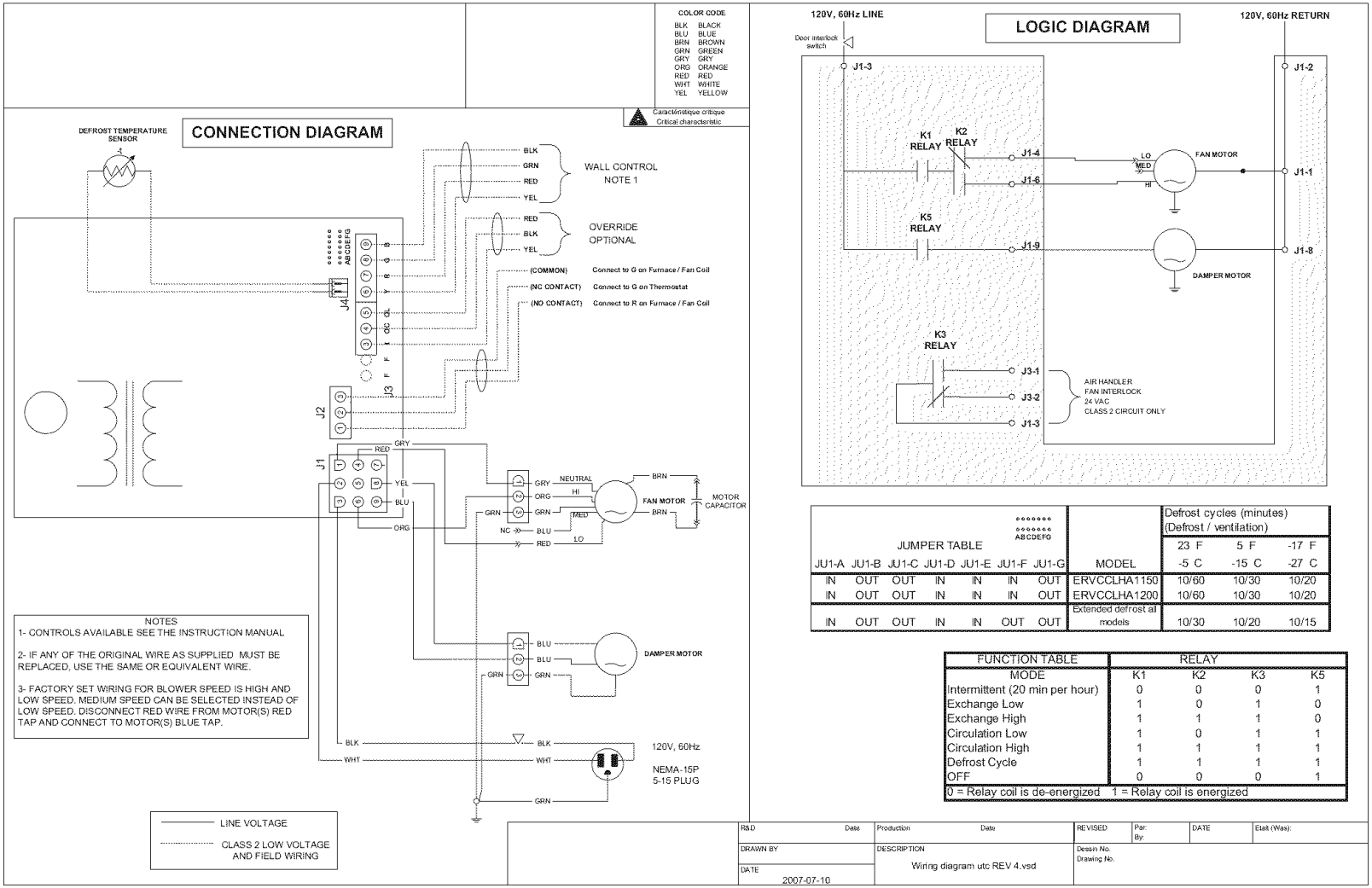
When unit is not responding to wall control, check outdoor air thermistor.

1. Remove thermistor wire from control board.
2. Take ohm reading across thermistor.
3. Refer to Table 8 for temperature/ohm relationship.

Be sure to unplug and inspect the unit before proceeding with these steps. Start with problem 1, then problem 2 and so on.

Table 6 – Troubleshooting

Problem:	Possible causes:	You should try this:
1. Unit does not work.	• Erratic operation of the electronic circuit.	• Unplug the unit. Wait for 30 seconds. Plug it back in.
	• The breaker in the electrical panel may be tripped.	• Reset breaker. If it trips again, unplug the unit and call an electrician.
	• The door switch may be defective	• Using a multimeter, check for power across the switch (the door switch must be pushed in for this test). If there is no power, replace the switch.
	• The circuit board may be defective.	• Jump "B" and "G" (BLACK and GREEN). If unit switches to high speed, remove the wall control and test it right beside the unit using another shorter wire. If the wall control works there, change the wire. If it does not, change the wall control. 
	• The fan motor may be defective.	• Unplug the unit and disconnect the fan motor (4 wires). Supply 120 V directly to the GREY and ORANGE wires of the fan motor. Replace the motor if not working.
	• The 9-pin connector may have a loose connection.	• Unplug the unit and check to make sure all the crimp connections are sound. Check the fan motor and the damper actuator connections as well.
2. The damper actuator does not work.	• The 9-pin connector may have a loose connection.	• Unplug the unit and check to make sure all the crimp connections are secured. Check the damper actuator connections as well.
	• The damper actuator may be defective.	• Feed 120 V directly to the damper actuator. If the problem persists, replace the damper actuator.
	• The circuit board may be defective.	• Replace the circuit board if the problem is not solved by the above.
3. The wall control will not work.	• The wire in the wall OR the wall control may be defective.	• Remove the wall control and test it right beside the unit using another shorter wire. If the wall control works there, change the wire. If it does not, change the wall control.
	• The wires may be in reverse position.	• Ensure that the color coded wires have been connected to their appropriate places.
	• The wires may be broken.	• Inspect every wire and replace any that are damaged.
	• There may be a short-circuit.	• With the help of a multimeter, check for continuity.
4. The 20-minute lighted push-button switch doesn't work OR its indicator light doesn't stay on.	• The switch may be defective.	• Jump the OL and OC terminals. If the unit switches to high speed, then the wires are not the problem. Replace the push-button. 
	• The wires may be defective OR may not be connected properly.	• Ensure that the color-coded wires have been connected to their appropriate places.
5. The defrost cycle does not work (the fresh air duct is frozen OR the fresh air distributed is very cold.)	• Ice deposits may be hindering the damper operation.	• Remove the ice.
	• The damper rod or the port damper itself may be broken.	• Inspect these parts and replace if necessary.
	• The damper actuator may be defective.	• Plug in the unit and select "OFF". Press the door switch and see if the port damper closes. If it does not close, feed 120V directly to the damper actuator. If the port damper still does not close, replace the damper actuator.
	• The circuit board may be defective.	• Unplug the unit. Unplug the defrost sensor wire (see J4 on electrical diagram). Plug the unit back in. Select "MIN" and make sure the unit is adjusted for low speed operation. Wait 3 minutes. The unit should switch to high speed and the damper at the fresh air intake port should close (defrost mode). If this does not happen, then replace the circuit board.
	• The thermistor may be defective.	• If the defrost mode works well after having disconnected the thermistor wire (above test), this means the thermistor is probably defective. It should be replaced.



JUMPER TABLE								Defrost cycles (minutes) (Defrost / ventilation)		
JU1-A	JU1-B	JU1-C	JU1-D	JU1-E	JU1-F	JU1-G	MODEL	23 F / -5 C	5 F / -15 C	-17 F / -27 C
IN	OUT	OUT	IN	IN	IN	OUT	ERVCCLHA1150	10/60	10/30	10/20
IN	OUT	OUT	IN	IN	IN	OUT	ERVCCLHA1200	10/60	10/30	10/20
IN	OUT	OUT	IN	IN	OUT	OUT	Extended defrost all models	10/30	10/20	10/15

FUNCTION TABLE	RELAY			
MODE	K1	K2	K3	K5
Intermittent (20 min per hour)	0	0	0	1
Exchange Low	1	0	1	0
Exchange High	1	1	1	0
Circulation Low	1	0	1	1
Circulation High	1	1	1	1
Defrost Cycle	1	1	1	1
OFF	0	0	0	1
0 = Relay coil is de-energized 1 = Relay coil is energized				

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Fig. 12 - ERV Wiring Diagram

Table 7 – System Wiring Colors and Connections

CONTROL MODULE		WALL CONTROL WIRE	WALL CONTROL	
Term. Block No.	Term. Block ID	Color	Term. No.	Term. ID
J3–9	B	Black	J1–4	B
J3–8	G	Green	J1–3	G
J3–7	R	Red	J1–2	R
J3–6	Y	Yellow	J1–4	Y

Table 8 – Temperature/Ohm Relationship

Temp. (°F / °C)	Ohms
30 / –1	34,480
32 / 0	32,680
34 / 1	30,760
36 / 2	29,220
38 / 3	27,470
40 / 4	26,020
42 / 6	24,680
44 / 7	23,320
46 / 8	22,070
48 / 9	20,910
50 / 10	19,830
52 / 11	18,820
54 / 12	17,870
56 / 13	16,920
58 / 14	16,160
60 / 16	15,260
62 / 17	14,530
64 / 18	13,790
66 / 19	13,090
68 / 20	12,480
70 / 21	11,860
72 / 22	11,270
74 / 23	10,750
76 / 24	10,250
78 / 26	9,750
80 / 27	9,300
82 / 28	8,840
84 / 29	8,432
86 / 30	8,042
88 / 31	7,668
90 / 32	7,310
92 / 33	6,993
94 / 34	6,661
96 / 36	6,368
98 / 37	6,085
100 / 38	5,811
102 / 39	5,571
104 / 40	5,313
106 / 41	5,088
108 / 42	4,869
110 / 43	4,660
112 / 44	4,450
114 / 46	4,268
116 / 47	4,019
118 / 48	3,918
120 / 49	3,750

Table 9 – Factory Set Blower Connection HIGH or LOW Speed

Control Module	Main Electrical Harness Cable	Blower Wire	Speed
J1–6	Orange	Orange	High
No Connection	No Connection	Blue + Cap	Medium
J1–4	Red	Red	Low

Table 10 – Modify Blower Connection HIGH or MEDIUM Speed

Control Module	Main Electrical Harness Cable	Blower Wire	Speed
J1–6	Orange	Orange	High
J1–4	Red	Blue	Medium
No Connection	No Connection	Red + Cap	Low

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